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ABSTRACT

Students are often evaluated on the basis of their aggregate or average performance on diverse tasks in each school subject. When the target of prediction is such global measures as course grades, academic self-efficacy, too, should be able to reflect equivalent scope and generality to maximize its predictive utility. Academic self-efficacy in the present study was assessed as either confidence ratings toward samples of problems typically performed in each school subject or responses on the self-efficacy scale of the Motivated Learning Strategies Questionnaire (MSLQ), which asks for students' overall academic confidence in a given domain without making any explicit reference to individual tasks. Participants (588 high school students) reported both types of efficacy in English, Spanish, American history, algebra, geometry, and chemistry. Results show that, in general, relations of the MSLQ self-efficacy results to effort and grades are stronger than those of the problem-referenced efficacy. It is interesting to note that predictive superiority of the MSLQ scale is more predominant in verbal subjects than in quantitative domains. It is concluded that relationships between academic self-efficacy and outcome measures would be less influenced by the specificity mismatch in subject matters that are clearly definable in terms of the skills and tasks performed. (Contains two figures and eight references.) (Author/SLD)

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Congruence of Measurement Specificity on Relations Between Academic Self-Efficacy, Effort, and Achievement Indexes

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Abstract

Students are often evaluated on the basis of their aggregate or average performance on diverse tasks in each school subject. When the target of prediction is such global measures as course grades, academic self-efficacy, too, should be able to reflect equivalent scope and generality to maximize its predictive utility. Academic self-efficacy in the present study was assessed as either (a) confidence ratings toward samples of problems typically performed in each school subject or (b) responses on the self-efficacy scale of the Motivated Learning Strategies Questionnaire (MSLQ), which asks for students' overall academic confidence in a given domain without making any explicit reference to individual tasks. 588 students reported both types of self-efficacy in English, Spanish, American history, Algebra, Geometry, and Chemistry. Results showed that, in general, relations of the MSLQ self-efficacy to effort and grades were stronger than those of the problem-referenced efficacy. Interestingly, predictive superiority of the MSLQ scale was more predominant in verbal subjects than in quantitative domains. It was concluded that relationships between academic self-efficacy and outcome measures would be less influenced by the specificity mismatch in subject matters that were clearly definable in terms of the skills and tasks performed.

Recently, social cognitive researchers (e.g., Pajares, 1996; Zimmerman, 1996) raised concerns on the specificity of measurement practices in academic self-efficacy research. Bandura (1977, 1986) claimed that self-efficacy as a causal construct is most useful when it is assessed at the same level of specificity and scope to the performance of interest. The theory thus implies that relations observed between efficacy and performance assessed at different levels of specificity undoubtedly suffer from certain degrees of mitigation.

In school, the oft-employed unit of evaluation is seldom a single specific task. Students are evaluated more frequently on the basis of their aggregate or average performance on diverse tasks required in each school subject. When the target of prediction is such general achievement indexes as course grades, it is difficult, if not impossible, to reflect in self-efficacy assessment the whole range of specific tasks that students are asked to perform. Consequently, it becomes inevitable to sacrifice to some degree either the scope or the particularity of efficacy rating tasks.

There are ways for measuring the general-level efficacy without losing too much of its predictive utility. A quick look at the literature reveals the two most frequently employed such methods. The first method is to present samples (or descriptions) of tasks typically performed in a given domain and ask students to report their confidence for successfully executing each of the tasks listed. The second method is to ask students to report directly their overall academic confidence in a given domain, without making any explicit reference to individual tasks.

The present investigation compares and contrasts relations observed between indicators of academic self-efficacy, effort, and achievement. Specifically, it examines

relations of academic self-efficacy judgments measured by two different methods with indexes of effort and grades in the following six school subjects: English, Spanish, American history, algebra, geometry, and chemistry. Two most commonly used types of academic self-efficacy scales have been adopted: (a) confidence ratings for a set of specific problems in each school subject and (b) a composite score on the self-efficacy scale of the Motivational Strategies for Learning Questionnaire (MSLQ; Pintrich & De Groot, 1990) for each school subject.

Given the social cognitive psychologists' claim that self-efficacy measures constructed with the same level of specificity to the target performance exhibit the greatest predictive power (Pajares, 1996), the MSLQ self-efficacy scale was hypothesized to display stronger relationships with indexes of effort and grades. It was also hypothesized that subject matters that were clearly definable in terms of skills and tasks performed would not be influenced much by the scale differences compared to those that were difficult to define. Relationships between efficacy and grades in verbal subjects, therefore, were hypothesized to be more strongly affected by the specificity mismatch than in math and science subjects.

Method and Procedures

588 high school students from four high schools in two different school districts in Los Angeles County, California, participated. Seven representative problems for each of the six school subjects were selected for assessing students' academic self-efficacy judgments for specific problems. The problems were presented through an overhead projector for 10 to 20 seconds. At this time, students reported their confidence for solving correctly each type of the problems presented.

As a second type and more general-level academic self-efficacy measure, students' responses on the self-efficacy scale of the MSLQ were obtained. Among the original questions in the MSLQ, those asking for normative judgment of ability were excluded. Zimmerman and others (Marsh, Walker, & Debus, 1991; Zimmerman, 1995, 1996; Zimmerman & Martinez-Pons, 1990) discussed that academic self-efficacy assessment puts more emphasis on mastery criteria (i.e., being able to succeed) rather than normative ones (i.e., being better than others). The final scale contained six questions for each school subject. Finally, students reported their most recent grade and usual effort expenditure in each of the six school subjects. There were three questions asking about students' effort investment in each subject matter.

Results and Discussion

Both types of academic self-efficacy scales as well as effort expenditure scales for six school subjects displayed acceptable reliability. The standardized coefficient αs ranged between .84 and .97.

Correlations Between Problem-Referenced and Course-Referenced Academic Self-Efficacy Judgments

Problem-referenced and course-referenced (i.e., the MSLQ) academic self-efficacy scales were significantly and positively correlated with each other across six school subjects. The correlation coefficients were .45 in English, .72 in Spanish, .40 in US history, .63 in algebra, .68 in geometry, and .55 in chemistry. In general, the two scales were more highly correlated in math and science subjects than in verbal subjects, with an exception of Spanish.

Correlations Between Academic Self-Efficacy, Effort, and Grades

Students' composite self-efficacy scores formed in reference to specific problems were significantly and positively related to their usual effort expenditure in all six school subjects (minimum r = .11, maximum r = .47, median r = .26). The relationships tended to be stronger for math and science subjects (i.e., algebra, geometry, and chemistry; average r = .33) than for verbal subjects (i.e., English, Spanish, and US history; average r = .16). The problem-referenced perceptions of academic self-efficacy also exhibited a significant positive relationship with students' grade in each school subject, with an exception of US history (minimum r = .08, maximum r = .60, median r = .43).

With the MSLQ self-efficacy scale, all relationships emerged with statistical significance and also in greater magnitude compared to those obtained with the problem-referenced self-efficacy scales (minimum r = .26, maximum r = .59, median r = .31 with effort scales, minimum r = .26, maximum r = .65, median r = .55 with grades). Such results are in accord with social cognitive theorists' claim that congruence of measurement specificity to the performance index ensures the greatest predictive power of academic self-efficacy judgments. Compared to the insignificant or marginal relationships observed in US history between efficacy perception, effort, and a grade with the problem-level efficacy scale, the more general MSLQ self-efficacy scale demonstrated substantial relations with performance indexes (r = .26 with both effort and grade).

Academic self-efficacy judgments formed in reference to more general events, therefore, demonstrated stronger predictive utility compared to efficacy ratings constructed in reference to a sample of specific problems. The MSLQ efficacy scores were correlated more highly with students' effort expenditure and grades in all six school

subjects. As hypothesized, the relative superiority of the MSLQ efficacy scale over the problem-referenced self-efficacy in predicting effort investment and grades was more predominant in verbal subjects than in math or science subjects.

Structural Models of Efficacy, Effort, and Achievement in Verbal and Quantitative Domains

The results thus far indicate that academic self-efficacy assessed by the MSLQ scale predicts students' grades in diverse school subjects better than composite scores of the problem-referenced academic self-efficacy ratings. Next, a structural model of academic self-efficacy, effort expenditure, and achievement was fitted to the two sets of data to find out whether even more general constellation of academic self-efficacy--Verbal and Quantitative Academic Self-Efficacy--can be clearly defined and still retain their predictive utility over effort investment and achievement factors in their respective areas.

When the structural models were fitted to the two sets of data, some interesting results were observed (see Figures 1 and 2). The first-order Chemistry Academic Self-Efficacy factor loaded on both the second-order Verbal and Quantitative Academic Self-Efficacy,with the problem-referenced efficacy scores. However, it loaded exclusively on Quantitative Academic Self-Efficacy with the MSLQ self-efficacy. Also, the correlation between Verbal and Quantitative Academic Self-Efficacy was higher (r = .59) with the problem-referenced self-efficacy than with the MSLQ self-efficacy scale (r = .46). Students appear to make clearer distinction between their capability to function in verbal and quantitative domains when they judge their academic self-efficacy in reference to more general events.

Relations of the MSLQ self-efficacy to effort and achievement were stronger than those of the problem-referenced efficacy only in the verbal domain. Relationships between academic self-efficacy, effort, and achievement in the quantitative domain did not differ to any noticeable degree by the self-efficacy scales employed. This result corroborates findings from the correlational analysis reported above.

On the whole, findings from the present study supports the notion that the specificity mismatch between the self and performance constructs causes attenuation in the observed relationships. The impact of such practice is minimized, however, in subject matters that are easily defined in terms of requisite skills and tasks. In addition, the extremely weak relations between perceived effort and grades obtained in the current study question the utility of effort indexes constructed in reference to more general events, lacking the immediacy and specificity that have usually been associated with other effort indicators (e.g., persistence).

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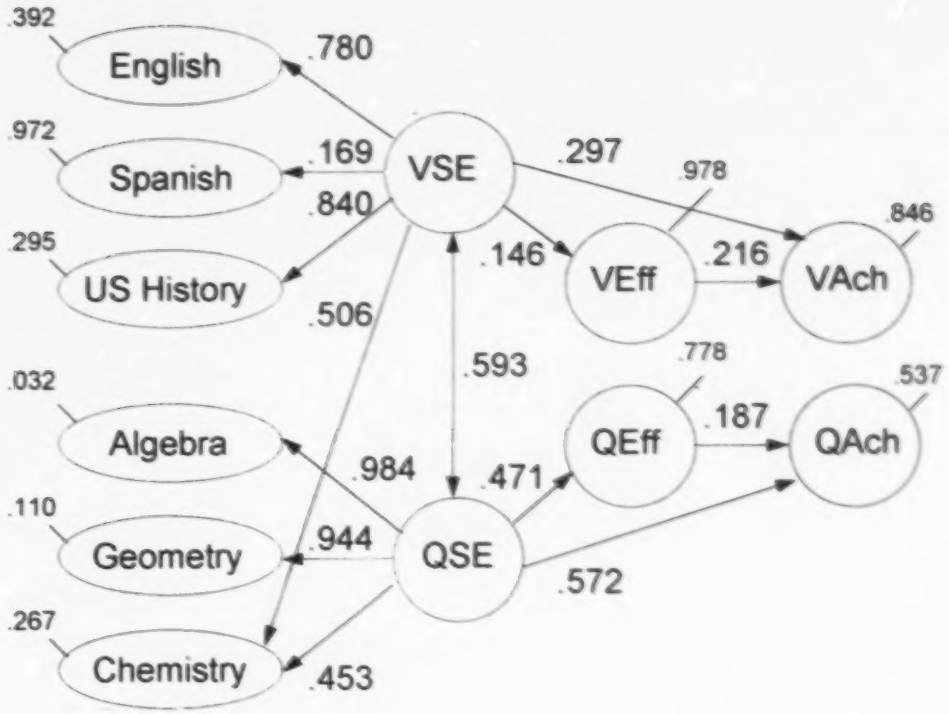
Figure Captions

Figure 1. A Final Structural Model With the Problem-Referenced Academic Self-Efficacy. V = Verbal; Q = Quantitative; SE = Academic Self-Efficacy; Eff = Effort; Ach = Achievement. Disturbance terms are correlated between Verbal and Quantitative Effort and between Verbal and Quantitative Achievement. All paths are significant at $p < .05$.

Figure 2. A Final Structural Model With the MSLQ Academic Self-Efficacy. V = Verbal; Q = Quantitative; SE = Academic Self-Efficacy; Eff = Effort; Ach = Achievement. Disturbance terms are correlated between Verbal and Quantitative Effort and between Verbal and Quantitative Achievement. All paths are significant at $p < .05$, except for the path from Verbal Effort to Verbal Achievement.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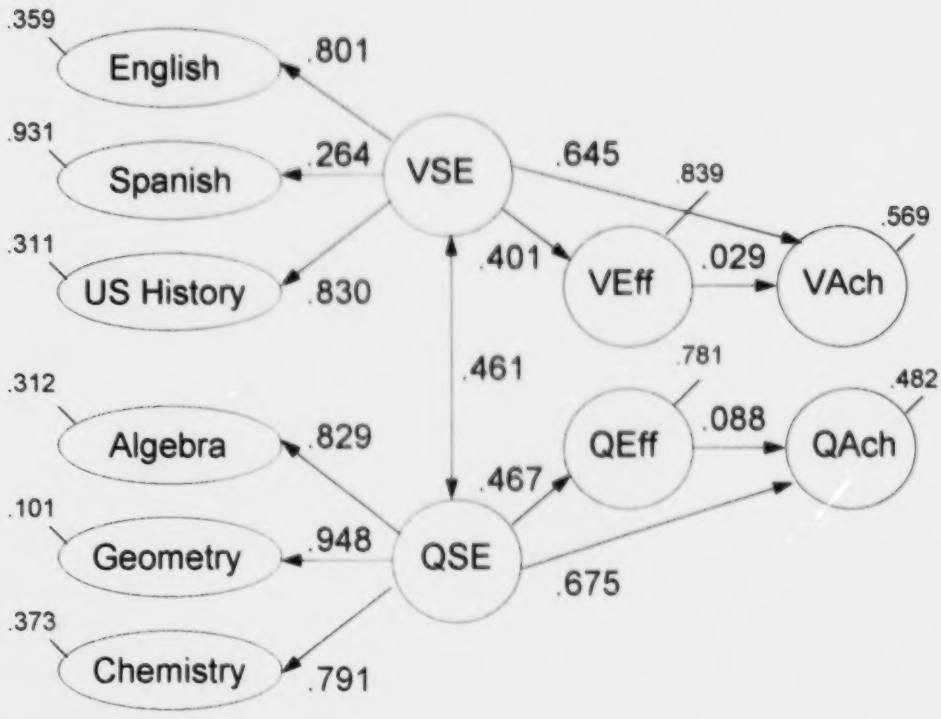
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